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16 April 2004

Dear Sirs

INTERNATIONAL BUSINESS MACHINES CORPORATION**Application No: PCT/GB 03/00667****Docket No: GB020037**

1. In reply to the written opinion under PCT Rule 66 dated 23 January 2004, please make the following amendments to this application:

DESCRIPTION: Replace pages 2 and 3 with new pages 2, 3 and 3a

CLAIMS: Replace claims 1-11 with new claims 1-8

2. Amendment

Applicant has amended independent claim 1 to include the feature of original claims 3 and 7. Applicant has further included the central bore feature of claim 2. Applicant submits that it would be appreciated by the skilled person that the gripping device does not have to be tubular and thus that it is not necessary to include this feature in the new claim 1.

Applicant has amended original independent claim 9 (now claim 7) to include the subject matter of original claim 10.

Consequential amendments have also been made to the summary section. Further D1 and D2 have been mentioned in the background section as requested.

3. NoveltyDE 42 03 093 (D1) - independent claim 1

As admitted by the Examiner, D1 does not disclose a device using a first and second locking piece.

Consequently the present invention is novel over D1.

US 3166810 (D2) - independent claim 7

D2 does not disclose attachment devices that are freely rotatable about an axis normal to the base. Rather D2 discloses the use of a plurality of bores, each one for holding cable therein via the use of set screws (please see figures 1 and 4).

Thus claim 7 is novel over D2.

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4. Unity

Applicant prefers to wait until national phase before addressing the Examiner's remark with regard to unity.

5. Inventive Step

DE 42 03 093 (D1) - independent claim 1

D1 also does not provide any suggestion of the use of a first and second locking piece. In D1 the wire is placed around cylindrical member 5 and is held in place as a result of a pulling force being applied to the wire - when such a force is applied, the cylindrical member slides into slot 3 and thus the wire maintained in position around member 5. There is nothing in D1 to suggest that any improvement on this mechanism is required and so the skilled person would therefore not be motivated to arrive at a solution using a first and second locking piece.

It is only with the benefit of hindsight that the advantageous nature of the solution of claim 1 becomes clear. The first locking piece is used to temporarily hold the cable loop in place. The second locking piece is then used to finally secure the cable loop in place. Thus no pulling force is required to maintain the cable loop. Thus the use of two lock pieces provides for a securer solution.

Claim 1 is therefore inventive over D1.

US 3166810 (D2) - independent claim 7

D2 does not provide any suggestion of the use of rotatable attachment devices. The whole solution of D2 is based around the use of bores which run through cylindrical body 7 and are for receiving wire strands therein which are then fastened in place using set screws. Thus there is no indication of the need for the attachment devices of the presently claimed solution.

It is only with hindsight that the advantageous nature of the solution claimed in claim 7 can be appreciated. Cable has a memory and can become twisted during the installation process. This can slow the process and can potentially lead to damage of the cable due to displacement of the internal conductors. The use of rotatable attachments alleviates this problem.

D2 is not faced with this problem. It is clear from figure 8 that the device disclosed in D2 is predominantly for use when pulling cable through a conduit that is not much larger than the diameter of the cable itself. Further it is not multiple cables that are being gripped by the device but rather multiple wire strands surrounded by a protective sheath (see figure 8 and also column 1, lines 59 to 63). For both these reasons the cable is unlikely to become twisted during the installation process... and thus rotatable attachment devices are not necessary. Thus the skilled person would find no motivation from D2 to arrive at the solution of claim 7.

It should now therefore be appreciated that this solution is inventive over D2.

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6. Conclusion

It is believed that the application as amended now meets all the requirements of the PCT. If the Examiner agrees with this opinion, the Applicant requests that the International Preliminary Examination Report be issued as soon as possible. Otherwise, the Applicant requests that the Examiner issue a second written opinion identifying those issues which still need addressing.

Yours faithfully

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Enc: New Pages 2, 3 and 3a
New Claims 1-8
Form 1037

CLAIMS

1. A device for gripping a cable, comprising an elongated housing for slidably receiving the cable axially thereof, the housing having a central bore along which the cable can pass, and an aperture which opens in at least one side of the housing thereby enabling the end of the cable to leave the housing through such aperture, the housing further being configured such that the cable can be received back by the housing to form a loop, the device further including means for securing at least the part of the cable received back by the housing, wherein the housing has a head, and said means for securing the cable loop comprises a first lock piece for temporarily holding the cable loop against the head and a second lock piece for securing the first lock piece against the cable loop.
2. The device of claim 1, wherein the housing is tubular.
3. The device of claim 1 or 2, wherein the housing has a recess in the side of the housing opposite the aperture opening, the end of the cable being received in such recess.
4. The device of claim 1 or 2, wherein the aperture extends fully across the width of the housing to open in the opposite sides of the housing, the cable leaving the housing through one end of the aperture and being received back by the housing through the other end of the aperture.
5. The device of any preceding claim, wherein the ceiling of the aperture is slanted to guide the cable out through the aperture.
6. The device of any preceding claim further comprising a biasing means for biasing the first lock piece towards the head.
7. A device for pulling a plurality of cables, comprising a base and means for attaching each of the plurality of cables to the base, the attachment means comprising a first central attachment device and an even number of further attachment devices symmetrically surrounding the central device, wherein each attachment device is freely rotatable about an axis normal to the base.

8. The device of claim 8, wherein each attachment device comprises a quick-release loop.

The use of a pulling sock is not suitable for gripping these new cables for a number of reasons. Current pulling socks are designed for much thicker cables and it is physically difficult to make them small enough to grip the newer type of cable securely. Further, the length of the cable gripped by the pulling sock has to be thrown away. This is because, the gripping action of the sock is likely to have displaced the conductors within the cabling sheath and thus this part of the cable cannot be relied upon to work properly.

Further, the pulling sock is required to be relatively long in order to achieve a sufficient clamping force on the cable. This is because the sock's steel lattice only tightens around the cable as it is pulled. If the sock was any shorter, the cable might well have been pulled out of the sock before the steel lattice had a chance to grip it properly. The length of the pulling sock means that a large amount of cable is wasted.

WO 00/60714 discloses a device for connecting a wire or cable enabling the traction thereof. This device comprises a ring provided with one or several longitudinal grooves, an end piece provided with the same number of longitudinal grooves as in the ring and designed to fit inside said ring, whereby the longitudinal grooves in the end piece and the ring, when they are located opposite each other, form at least one housing that is adapted to the section of each wire, means (preferably by screwing) that lock the end piece inside the ring in an angular locking position where the corresponding grooves are offset in relation to the others, and protruding elements (threads on the inner side of the ring for example) that are adapted to grasp each wire of the cable in said locking position. This device can be used for drawing wires or electric cables in ducts or casings.

DE 42 03 093 discloses a tool for pulling and drawing cable through a trough or channel and is able to grip the end of a wire loop around a cylindrical element which can rotate and slide within a slot

US 3,166,810 discloses a device for drawing or pulling electric cable through tubular conduits or the like. The device has a cylindrical body with a plurality of bores for receiving wire strands therein which are then secured with set-screws.

Summary of the Invention

Accordingly, the invention provides a device for gripping a cable, comprising an elongated housing for slidably receiving the cable axially thereof, the housing having a central bore along which the cable can pass, and an aperture which opens in at least one side of the housing thereby enabling the end of the cable to leave the housing through such aperture, the housing further being configured such that the cable can be received back by the housing to form a loop, the device further including means for securing at least the part of the cable received back by the housing, wherein the housing has a head, and said means for securing the cable loop comprises a first lock piece for temporarily holding the cable loop against the head and a second lock piece for securing the first lock piece against the cable loop.

The device is intended to be used in place of the prior art pulling sock shown in figure 1. The prior art pulling sock has a loop which permits it to be attached to a pulling fuse or similar device. The device of WO 00/60714 also has a cavity in the device's head which permits its fixing with a means of traction. The gripping device of the present invention is not supplied with a loop or other means of traction. Instead the cable itself is used to form a loop by which the cable can be attached to the pulling fuse or similar device. (Of course, the gripping device could be attached directly to a handle or a pulling rope, but this would risk the installers inadvertently over stretching the cable and thereby damaging it).

Using the cable loop as an attachment means is particularly advantageous. This reduces the number of parts that need to be supplied with the device and therefore reduces manufacturing costs.

A further aspect of the invention will now be described. It is important when multiple cables are pulled that a symmetrical pulling force is exerted and that the tension on each cable is substantially identical. This is because, as previously mentioned, the cables are likely to be damaged if over stretched. Therefore a pulling fuse or similar device is used which will break if a predetermined force is applied during the pulling process and thus prevent the application of an excessive force. In order to ensure that the device severs at the correct point in time, the force applied is required to be a symmetrical one.

3a

central attachment device and an even number of further attachment devices symmetrically surrounding the central device, wherein each attachment device is freely rotatable about an axis normal to the base.

Cable has a memory and can become twisted during the installation process. This can slow the process and can potentially lead to damage to the cable due to displacement of the internal conductors. This is the reason that each attachment means is freely rotatable about the base and thus can move with the cable. Preferably each attachment means comprises a quick-release loop to make their use as easy as possible.

In a yet further aspect, the invention provides a device for pulling substantially as herein before described with reference to figures 3a, 3b and 3c.

In a further aspect, the invention provides a device for pulling a plurality of cables, comprising a base and means for attaching each of the plurality of cables to the base, the attachment means comprising a first